1. A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on each capacitor of said set of capacitors in parallel;

means to linearly control the switching function for each of said set of continuous switching devices;

means for a set of translinear amplifier stages to produce said linear controls for said switching functions;

means to individually provide the threshold points for each individual capacitor switching stage; and

means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

2. The circuit of claim **1** wherein said switching device is a transistor.

3. The circuit of claim **2** wherein said switching device is a P-MOS or N-MOS junction FET.

4. The circuit of claim **2** wherein said switching device is a CMOS FET.

5. The circuit of claim **1** wherein said means to individually provide said threshold points for each individual capacitor switching stage generates a set of reference values, one value for each capacitor switching stage.

6. The circuit of claim 5 wherein said means to generate a set of reference values, one for each of said translinear amplifier stages, is implemented as a chain of resistors.

7. The circuit of claim **1** wherein said translinear amplifier has a gain of 1, the typical gain of translinear amplifiers.

8. The circuit of claim **1** wherein said translinear amplifier has a gain differing from 1, which gives one more degree of freedom to optimize operating parameters, like overlapping of capacitor switching operation.

9. The circuit of claim **1** wherein said means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, is a single signal connected to all amplifier inputs.

10. The circuit of claim **1** wherein the means to provide the output reference signal for the translinear amplifier, is a single signal connected to all translinear amplifier reference outputs.

11. The circuit of claim **1** wherein said capacitors are discrete capacitor components.

12. The circuit of claim **1** wherein said capacitors are manufactured on a planar carrier.

13. The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate, but on a separate substrate than said switching devices and amplifiers.

14. The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate and on the same substrate as said switching devices and amplifiers.

15. The circuit of claim **1** wherein said capacitors are manufactured as a Metal-Oxide structure.

16. The circuit of claim **1** wherein said capacitors are manufactured as a junction capacitor.

17. A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same

time by sharply cutting off the control signal, when said switching device is outside its dedicated active working area; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on each capacitor of said set of capacitors in parallel;

means to linearly control the switching function for each of said set of continuous switching devices, when said switching device is in its dedicated active working area;

means to drive said switching device to a fully on status, when said switching device is outside its dedicated active working area on the lower resistance side.

means to drive said switching device to a fully off status, when said switching device is beyond its dedicated active working area on the higher resistance side.

means for a set of translinear amplifier stages to produce said linear controls for said switching functions;

means to individually provide the threshold points for each individual capacitor switching stage; and

means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

18. The circuit of claim **17** wherein said means to drive said switching device to a fully-on status, when said switching device is outside its dedicated active working area on the lower resistance side is provided by additional circuit elements, working as a signal-limiting function.

19. The circuit of claim **17** wherein said means to drive said switching device to a fully-off status, when said switching device is outside its dedicated active working area on the higher resistance side is provided by additional circuit elements, working as a signal-limiting function.

20. The circuit of claim **18** wherein said signal-limiting function to drive said switching device to a fully-on status, when said switching device is outside its dedicated active working area on the lower resistance side, are implemented within the translinear amplifier circuit.

21. The circuit of claim **19** wherein said signal-limiting function to drive said switching device to a fully-off status, when said switching device is outside its dedicated active working area on the higher resistance side, are implemented within the translinear amplifier circuit.

22. The circuit of claim **17** wherein said translinear amplifier has a gain of 1, the typical gain of translinear amplifiers.

23. The circuit of claim **17** wherein said translinear amplifier has a gain differing from 1, which gives one more degree of freedom to optimize operating parameters, like overlapping of capacitor switching operation and signal cut-off at the edges of the dedicated active working area.

24. The circuit of claim **17** wherein said capacitors are discrete capacitor components.

25. The circuit of claim **17** wherein said capacitors are manufactured on a planar carrier.

26. A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time and to compensate the temperature deviation of the capacitor switching device; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on each capacitor of said set of capacitors in parallel;

means to linearly control the switching function for each of said set of continuous switching devices;

means for a set of translinear amplifier stages to produce said linear controls for said switching functions;

means to compensate the temperature deviation of said switching device;

means to individually provide the threshold points for each individual capacitor switching stage; and

means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

27. The circuit of claim **26** wherein said means to compensate the temperature deviation of said switching device is provided by feeding a modified reference voltage to said translinear amplifier's output reference point, to mirror a temperature correcting signal into the control signal of said switching device.

28. The circuit of claim **27** wherein said means to compensate the temperature deviation of said switching device, uses a device of the same type as said switching device itself, to produce an exact equivalent of said temperature deviation.

29. A circuit to control the capacitance of a variable capacitor in a steady mode, but with predefined non-linear relation to the tuning voltage, through a steady tuning voltage and to achieve a high Q-factor at the same time; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on each capacitor of said set of capacitors in parallel;

means to linearly control the switching function for each of said set of continuous switching devices;

means for a set of translinear amplifier stages to produce said linear controls for each of said set of continuous switching devices;

means to individually provide the threshold points for each individual capacitor switching stage;

means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages and;

means to provide a non-linear relation between said tuning voltage and said threshold points.

30. The circuit of claim **29** wherein said means to individually provide said threshold points for each individual capacitor switching stage generates a set of reference values, one value for each capacitor switching stage.

31. The circuit of claim **29** wherein said means to provide a non-linear relation between said tuning voltage and said threshold points is provided by specifically selecting the steps of said set of reference values in a way, to achieve said desired non-linear relation.

32. The circuit of claim **30** wherein said means to generate a set of reference values, one for each of said translinear amplifier stages, is implemented as a chain of resistors.

33. A method to control the capacitance of a variable capacitor in a strictly linear mode through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on each capacitor of said set of capacitors in parallel, means to linearly control the switching function for each of said continuous switching devices, means for a set of translinear amplifier stages to produce said linear controls for said switching functions, means to linearly control said switching function for each of said set of continuous switching devices, means to individually provide the threshold points for each individual capacitor switching stage, means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages;

continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices;

amplifying, by the means of a translinear amplifier, the difference of the capacitance tuning voltage and the threshold points of each amplifier stage to produce the linear control signal for said continually switching operation;

providing said threshold points for each individual capacitor switching stage; and

supplying a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

34. The method of claim **33** wherein linearly controlling the switching operation applies to a transistor as said continuous switching device.

35. The method of claim **34** wherein linearly controlling the switching operation applies to a P-MOS or N-MOS junction FET as said continuous switching device.

36. The method of claim **34** wherein linearly controlling the switching operation applies to a P-channel or N-channel CMOS FET as said continuous switching device.

37. The method of claim **33** wherein individually providing said threshold points for each individual capacitor switching stage generates a set of reference values, one value for each capacitor switching stage.

38. The method of claim **37** wherein generating a set of reference values, one for each of said translinear amplifier stages, is performed by a chain of resistors.

39. The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to discrete capacitor components.

40. The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to capacitors manufactured on a planar carrier.

41. The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to capacitors integrated on a semiconductor substrate.

42. The method of claim **33** wherein supplying a tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages uses a single signal connected to all amplifier inputs.

43. A method to control the capacitance of a variable capacitor in a strictly linear mode through a tuning voltage and to achieve a high Q-factor at the same time by sharply cutting off the control signal, when said switching device is outside its dedicated active working area; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on said capacitors in parallel, one for each of said small capacitors, means to linearly control the switching function for each of said continuous switching devices, when said switching device is in its dedicated active working area, means to drive said switching device to a fully-on status, when said switching device is outside its dedicated active working area on the lower resistance side, means to drive said switching device to a fully-off status, when said switching device is beyond its dedicated active working area on the higher resistance side, means for a set of translinear amplifier stages to produce said linear controls for said switching functions, means to individually provide the threshold points for each individual capacitor switching stage, means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages;

continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices, when said switching device is in its dedicated active working area;

driving said switching device to a fully on status, when said switching device is outside its dedicated active working area on the lower resistance side;

driving said switching device to a fully off status, when said switching device is beyond its dedicated active working area on the higher resistance side;

amplifying, by the means of a translinear amplifier, the difference of the capacitance tuning voltage and the threshold points of each amplifier stage to produce the linear control signal for said continually switching operation;

providing said threshold points for each individual capacitor switching stage; and

supplying a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

44. The method of claim **43** wherein driving said switching device to a fully-on status, when said switching device is outside its dedicated active working area on the lower resistance side uses additional circuit elements, working as a signal-limiting function.

45. The method of claim **43** wherein driving said switching device to a fully-off status, when said switching device is outside its dedicated active working area on the higher resistance side uses additional circuit elements, working as a signal-limiting function.

46. The method of claim **44** wherein said signal-limiting operation to drive said switching device to a fully-on status, when said switching device is outside its dedicated active working area on the lower resistance is implemented within the translinear amplifier.

47. A method to control the capacitance of a variable capacitor in a strictly linear mode through a tuning voltage and to achieve a high Q-factor at the same time and to compensate the temperature deviation of the capacitor switching device; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on said capacitors in parallel, means for a set of translinear amplifier stages to produce said linear controls for said switching functions, means to linearly control the switching function for each of said continuous switching devices, means to compensate the temperature deviation of said switching device, means to individually provide the threshold points for each individual capacitor switching stage, means to provide a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages;

continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices;

compensating the temperature deviation of said switching;

amplifying, by the means of a translinear amplifier, the difference of the capacitance tuning voltage and the threshold points of each amplifier stage to produce the linear control signal for said continually switching operation;

providing said threshold points for each individual capacitor switching stage; and

supplying a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages.

48. The method of claim **47** wherein compensating the temperature deviation of said switching device is provided by feeding a modified reference voltage to said translinear amplifier's output reference point, to mirror a temperature correcting signal into the control signal of said switching device.

49. The method of claim **48** compensating the temperature deviation of said switching device, uses a device of the same type as said switching device itself, to produce an exact equivalent of said temperature deviation.

50. A method to control the capacitance of a variable capacitor in a steady mode, but with predefined non-linear relation to the tuning voltage, through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on said capacitors in parallel, means to linearly control the switching function for each of said continuous switching devices, means for a set of translinear amplifier stages to produce said linear controls for said switching functions, means to individually provide the threshold points for each individual capacitor switching stage, means to provide a signal,

dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages;

continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices;

amplifying, by the means of a translinear amplifier, the difference of the capacitance tuning voltage and the threshold points of each amplifier stage to produce the linear control signal for said continually switching operation;

providing said threshold points for each individual capacitor switching stage, producing non-linear instead of linear steps;

supplying a signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said translinear amplifier stages; and

providing a non-linear relation between said tuning voltage and said threshold points.

51. The method of claim **50** wherein individually providing said threshold points for each individual capacitor switching stage generates a set of reference values, one value for each capacitor switching stage.

52. The method of claim **50** wherein providing a non-linear relation between said tuning voltage and said threshold points is provided by specifically selecting the steps of said set of reference values in a way, to achieve said desired non-linear relation.